

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, DC 20460



OFFICE OF CHEMICAL SAFETY
AND POLLUTION PREVENTION

August 5, 2014

Cheryl Wagner
c/o Wagner Regulatory Associates, Inc.
P.O. Box 640
Hockessin, DE 19707

Subject: Label Notification per PRN 98-10 – add California restriction on hops
Product Name: Abacus Agricultural Miticide/Insecticide
EPA Registration Number: 83100-4
Application Date: May 5, 2014
Decision Number: 491240

Dear Ms Wagner:

The Agency is in receipt of your Application for Pesticide Notification under Pesticide Registration Notice (PRN) 98-10 for the above referenced product. The Registration Division (RD) has conducted a review of this request for its applicability under PRN 98-10 and finds that the action requested falls within the scope of PRN 98-10.

The label submitted with the application has been stamped “Notification” and will be placed in our records. If you have any questions, please contact Jessica Rogala at (703) 347-0263 or via email at rogala.jessica@epa.gov.

Sincerely,

A handwritten signature in blue ink, appearing to read "Meredith F. Laws" with a small flourish at the end.

Meredith F. Laws, Chief
Insecticide-Rodenticide Branch
Registration Division (7505P)
Office of Pesticide Programs

Enclosure

[Directions for use booklet/Front cover can be used as front container label]

PULL HERE TO OPEN

RESTRICTED USE PESTICIDE
TOXIC TO FISH, MAMMALS, AND AQUATIC ORGANISMS
FOR RETAIL SALE TO AND USE ONLY BY CERTIFIED APPLICATORS OR PERSONS UNDER THEIR DIRECT SUPERVISION, AND ONLY FOR THOSE USES COVERED BY THE CERTIFIED APPLICATOR'S CERTIFICATION.

ABACUS®

GROUP **6** INSECTICIDE

Agricultural Miticide/Insecticide

ACTIVE INGREDIENT:

Abamectin (CAS Nos: 65195-55-3 and 65195-56-4).....	2.0%*
Other Ingredients:.....	98.0%
Total:.....	100.0%

NOTIFICATION

*0.15 lb. Abamectin per gallon

08/05/2014

EPA Reg. No. 83100-4
EPA Est. No.: 069821-CHN-005

**KEEP OUT OF REACH OF CHILDREN
WARNING/AVISO**

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail.)

See additional precautionary statements and directions for use inside booklet.

Manufactured by:
Rotam Agrochemical Company Ltd.
7/F Cheung Tat Centre
18 Cheung Lee Street
Chai Wan, Hong Kong

Net Contents:
1 GALLON (3.78 Liters)

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FIRST AID (Avermectin B₁)	
If In Eyes	<ul style="list-style-type: none"> • Hold eye open and rinse slowly and gently with water for 15-20 minutes. • Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. • Call a poison control center or doctor for further treatment advice.
If Swallowed	<ul style="list-style-type: none"> • Do not induce vomiting unless told to do so by the poison control center or doctor. • Have person sip a glass of water if able to swallow. • Do not give anything by mouth to an unconscious person. • Call poison control center or doctor for treatment advice.
If Inhaled	<ul style="list-style-type: none"> • Move person to fresh air. • If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible. • Call poison control center or doctor for treatment advice.
If On Skin Or Clothing	<ul style="list-style-type: none"> • Take off contaminated clothing. • Rinse skin immediately with plenty of water for 15-20 minutes. • Call a poison control center or doctor for further treatment advice.
Note to Physician	
<p>Recommendations for Medical Treatment for ABACUS (Avermectin B₁) Acute Toxicity: Early signs of intoxication include mydriasis (dilated pupils), ataxia (unsteadiness), and muscle tremors. Toxicity follows accidental ingestion of the concentrate and can be minimized by inducing vomiting within one-half hour of exposure.</p> <p>If toxicity from exposure has progressed to cause severe vomiting, the extent of resultant fluid and electrolyte imbalance should be gauged. Appropriate supportive parenteral fluid replacement therapy should be given, along with other required supportive measures (such as maintenance of blood pressure levels) as indicated by clinical signs, symptoms, and measurements.</p> <p>In severe cases, observations should continue for at least several days until clinical condition is stable and normal. Since avermectin is believed to enhance GABA activity in animals, it is probably wise to avoid drugs that enhance GABA activity (barbiturates, benzodiazepines, valproic acid) in patients with potentially toxic avermectin exposure.</p>	
(Avermectin B₁)	
<p>Have the product container or label with you when calling a poison control center or doctor or going for treatment.</p> <p>For Medical Emergency treatment call your Local Poison Control Center for assistance.</p>	

PRECAUTIONARY STATEMENTS**Hazards to Humans and Domestic Animals****WARNING/AVISO**

Causes substantial but temporary eye injury. Harmful if swallowed. Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals. Wear protective eyewear (goggles or face shield). Do not get in eyes, on skin, or on clothing. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, or using the toilet. Remove and wash contaminated clothing before reuse.

This product contains a chemical (N-methyl pyrrolidone) known to the state of California to cause birth defects or other reproductive harm.

Personal Protective Equipment

Some materials that are chemical-resistant to this product are listed below. If you want more options, follow the instructions for Category B on an EPA chemical-resistant category selection chart.

Applicators and other handlers must wear:

- Coveralls worn over short-sleeved shirt and short pants
- Chemical-resistant gloves – EPA chemical resistance category B (e.g. barrier laminate or butyl rubber \geq 14 mils)
- Chemical-resistant footwear plus socks
- Protective eyewear
- Chemical-resistant headgear for overhead exposure
- Chemical-resistant apron when cleaning equipment, mixing or loading

Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them. Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

Environmental Hazards

This pesticide is toxic to fish and wildlife. Do not apply directly to water, to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not apply when weather conditions favor drift from target areas. Do not contaminate water when disposing of equipment wash water or rinsate. This product is highly toxic to bees exposed to direct treatment or residues on blooming crops or weeds. Do not apply this product or allow it to drift to blooming crops or weeds if bees are visiting the treatment area.

Use of this product may pose a risk to threatened and endangered species of fish, amphibians, crustaceans (including fresh water shrimp), and insects. All use of this product in the state of California should comply with the recommendations of the California Endangered Species Project. Before using this product in California, consult with your county agriculture commissioner to determine use limitations that apply in your area. This product may impact surface water quality due to runoff of rain water. This is especially true for poorly draining soils and soils with shallow groundwater. This product is classified as having a medium potential for reaching both surface water and aquatic sediment via runoff for several weeks to months after application. A level, well maintained vegetative buffer strip between areas to which this product is applied and surface water features such as ponds, streams, and springs will reduce the potential loading of abamectin from runoff water and sediment. Runoff of this product will be reduced by avoiding applications when rainfall is forecast to occur within 48 hours.

Physical or Chemical Hazards

Do not use or store near heat or open flame.

CONDITIONS OF SALE AND LIMITATION OF WARRANTY AND LIABILITY

NOTICE: Read the entire Directions for Use and Conditions of Sale and Limitation of Warranty and Liability before buying or using this product. If the terms are not acceptable, return the product at once, unopened and the purchase price will be refunded.

The Directions for Use of this product must be followed carefully. It is impossible to eliminate all risks inherently associated with the use of this product. Crop injury, ineffectiveness or other unintended consequences may result because of such factors as manner of use or application, weather or crop conditions, presence of other materials or other influencing factors in the use of the product, which are beyond the control of Rotam Agrochemical Company Limited or Seller. All such risks shall be assumed by Buyer and User, and Buyer and User agree to hold Rotam Agrochemical Company Limited and Seller harmless for any claims relating to such factors.

Rotam Agrochemical Company Limited warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes stated in the Directions for Use, subject to the inherent risks referred to above, when used in accordance with directions under normal use conditions. This warranty does not extend to the use of the product contrary to label instructions, or under abnormal conditions or under conditions not reasonably foreseeable to or beyond the control of Seller or Rotam Agrochemical Company Limited, and Buyer and User assume the risk of any such use. **TO THE EXTENT CONSISTENT WITH APPLICABLE LAW ROTAM AGROCHEMICAL COMPANY LIMITED MAKES NO WARRANTIES OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE NOR ANY OTHER EXPRESS OR IMPLIED WARRANTY EXCEPT AS STATED ABOVE.**

To the extent consistent with applicable law, Rotam Agrochemical Company Limited or Seller shall not be liable for any incidental, consequential or special damages resulting from the use or handling of this product. **TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, THE EXCLUSIVE REMEDY OF THE USER OR BUYER, AND THE EXCLUSIVE LIABILITY OF ROTAM AGROCHEMICAL COMPANY LIMITED AND SELLER FOR ANY AND ALL CLAIMS, LOSSES, INJURIES OR DAMAGES (INCLUDING CLAIMS BASED ON BREACH OF WARRANTY, CONTRACT, NEGLIGENCE, TORT, STRICT LIABILITY OR OTHERWISE) RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT, SHALL BE THE RETURN OF THE PURCHASE PRICE OF THE PRODUCT OR, AT THE ELECTION OF ROTAM AGROCHEMICAL COMPANY LIMITED OR SELLER, THE REPLACEMENT OF THE PRODUCT.**

Rotam Agrochemical Company Limited and Seller offer this product, and Buyer and User accept it, subject to the foregoing conditions of sale and limitations of warranty and of liability, which may not be modified except by written agreement signed by a duly authorized representative of Rotam Agrochemical Company Limited.

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DIRECTIONS FOR USE Restricted Use Pesticide

It is a violation of federal law to use this product in a manner inconsistent with its labeling.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR Part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE) and restricted-entry interval. The requirements on this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow worker entry into treated areas during the restricted-entry interval (REI) of 12 hours. Exception: For grape girdling, cane turning, and tying in grapes, do not enter or allow worker entry into treated areas during the restricted-entry interval (REI) of 4-days.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and involves contact with anything that has been treated, such as plants, soil, or water is:

- Coveralls over short-sleeved shirt and short pants
- Chemical-resistant gloves – EPA chemical resistance category B (e.g. barrier laminate or butyl rubber \geq 14 mils)
- Chemical-resistant footwear plus socks
- Protective eyewear
- Chemical-resistant headgear for overhead exposure

FAILURE TO FOLLOW DIRECTIONS AND PRECAUTIONS ON THIS LABEL MAY RESULT IN CROP INJURY, POOR PEST CONTROL, AND/OR ILLEGAL RESIDUES.

PRODUCT INFORMATION

Thorough coverage is essential for good mite and insect control on crops.

Do not apply Abacus by aerial application in New York State.

This product contains a chemical known to the state of California to cause birth defects or other reproductive harm.

Abacus is an emulsifiable concentrate that will control certain pests on the crops listed on this label when applied according to the Directions for Use.

Abacus has been tested for phytotoxicity and has a wide margin of safety on a variety of crops. Abacus has also been shown to be compatible with many commonly used pesticides, crop oils, and nutritional sprays. However, since it is not possible to test a large number of possible mixtures, the user should pre-test to

assure the physical compatibility and lack of phytotoxicity effect of any proposed mixtures with Abacus.

CHEMIGATION

Do not apply this product through any type of irrigation system.

SPRAY DRIFT

Responsibility

Avoiding spray drift at the application site is the responsibility of the applicator.

The interaction of many equipment and weather related factors determine the potential for spray drift. The applicator is responsible for considering all of these factors when making application decisions.

Note: When states have more stringent regulations, they must be observed.

Spray Drift Precautions for Application with Aircraft or Ground Application

Equipment

- Apply Abacus only when wind velocity favors on target product deposition (approximately 3 to 10 mph).
- Do not apply with ground application equipment within 25 ft. of or with aircraft within 150 ft. of lakes, reservoirs, rivers, permanent streams, marshes, pot holes, natural ponds, estuaries, or commercial fish farm ponds.
- Do not cultivate within 25 ft. of the aquatic area to allow growth of a vegetative filter strip.
- Do not allow this product to drift onto non-target areas. Drift may result in illegal residues or injury to non-target species. Risk of exposure to sensitive areas can be reduced by applying this product when the wind direction is away from the sensitive area.
- Do not apply when the weather conditions may cause drift.
- Avoid application when the temperature is high and/or the humidity is low. These conditions increase the evaporation of spray droplets and the likelihood of drift to aquatic areas.
- Do not apply when wind speed or wind gusts are greater than 15 mph.
- Do not apply when wind speed is below 2 mph because wind direction will vary and there is a high potential for inversion.
- Observe the following precautions when using ground application to spray tree crops or hops in the vicinity of aquatic areas such as lakes, reservoirs, permanent streams, marshes, potholes, natural ponds, estuaries, or commercial fish ponds:
 - Do not apply Abacus when weather conditions favor drift to aquatic areas.
 - Do not apply within 110 ft. upwind of aquatic areas or when wind speed is above 8 mph.
 - Spray last 3 rows windward of aquatic areas using nozzles on one side only, with spray directed away from the aquatic areas.
 - Avoid spray going over tops of trees by adjusting or turning off top nozzles. Shut off nozzles on the side away from the grove/orchard when spraying the outside row. Shut off nozzles when turning at ends of row and passing tree gaps in rows.

Spray Drift Precautions for Aerial Application

Drift Management Requirements

The following drift management requirements must be followed to avoid off-target movement from aerial applications to agricultural field crops.

- **Outermost Nozzle Distance**

The distance of the outermost nozzles on the boom must not exceed 3/4 the length of the wingspan or rotor.

- **Nozzle Direction**

Nozzles must always point backward parallel with the air stream and never be pointed downwards more than 45 degrees.

- **Maximum Wind Speed**

Do not apply when wind speed is greater than 15 mph.

- **Droplet Size**

The most effective way to reduce drift potential is to apply large droplets. The best drift management strategy is to apply the largest droplets that provide sufficient coverage and control. Applying larger droplets reduces drift potential but will not prevent drift if applications are made improperly, or under unfavorable environmental conditions (see **Wind, Temperature and Humidity, and Temperature Inversions**).

- **Controlling Droplet Size**

Volume: Use high flow rate nozzles to apply the highest practical spray volume. Nozzles with higher rated flows produce larger droplets.

Pressure: Do not exceed the nozzle manufacturer's recommended pressures. For many nozzle types, lower pressure produces larger droplets. When higher flow rates are needed, use higher flow rate nozzles instead of increasing pressure.

Number of Nozzles: Use the minimum number of nozzles that provide uniform coverage.

Nozzle Orientation: Orienting nozzles so that the spray is released parallel to the air stream produces larger droplets than other orientations and is the recommended practice. Significant deflection from horizontal will reduce droplet size and increase drift potential.

Nozzle Type: Use a nozzle type that is designed for the intended application. With most nozzle types, narrower spray angles produce larger droplets. Consider using low-drift nozzles. Solid stream nozzles oriented straight back produce the largest droplets and the lowest drift.

- **Boom Length**

For some use patterns, reducing the effective boom length to less than 3/4 of the wingspan or rotor length may further reduce drift without reducing swath width.

- **Application Height**

Applications should not be made at a height greater than 10 ft. above the top of the target plants unless a greater height is required for aircraft safety. Making applications at the lowest height that is safe reduces exposure of droplets to evaporation and wind.

- **Swath Adjustment**

When applications are made with a cross wind, the swath will be displaced downwind. Therefore, on the up and downwind edges of the field, the applicator must compensate for this displacement by adjusting the path of the aircraft upwind.

- **Wind**

Drift potential is lowest between wind speeds of 2-10 mph. However, many factors, including droplet size and equipment type determine drift potential at any given speed. Application must be avoided below 2 mph due to variable wind direction and high inversion potential.

Note: Local terrain can influence wind patterns. Every applicator should be familiar with local wind patterns and how they affect spray drift.

- **Temperature and Humidity**

To compensate for evaporation when applying Abacus in low relative humidity, set up equipment to produce larger droplets. Evaporation of droplets is most severe when conditions are both hot and dry.

- **Temperature Inversions**

Abacus must not be applied during a temperature inversion because the potential for drift is high. Temperature inversions restrict vertical air mixing, and this causes small,

suspended droplets to remain in a concentrated cloud. This cloud can move in unpredictable directions due to the light variable winds that are common during inversions. Temperature inversions are characterized by temperatures that increase with altitude and are common on nights with limited cloud cover and light to no wind. Inversions begin to form as the sun sets and often continue into the morning. Their presence can be indicated by ground fog; however, if fog is not present, the movement of smoke from a ground source or an aircraft smoke generator can also identify inversions. Smoke that layers and moves laterally in a concentrated cloud (under low wind conditions) indicates an inversion, while smoke that moves upward and rapidly dissipates, indicates good vertical air mixing.

Resistance Management: Because of the inherent risks of resistance development to any product, it is strongly advised that Abacus be used in a sound resistance management program that includes rotation with other products with different modes of action.

CROP USE DIRECTIONS

Apple: For control of white apple leafhopper, tentiform leafminers, European red mites, two-spotted spider mites, and McDaniel spider mites (Ground Application Only)

Apples	APPLICATION RATES	
Pests	For Dilute Sprays ¹ fl. oz. Abacus/100 gals.	For Concentrate Sprays ² fl. oz. Abacus/A
Two-spotted spider mite McDaniel spider mite European red mite Tentiform leafminers White apple leafhopper	2.5-5.0	10-20
Horticultural Spray Oil* (For best results, use oil with Abacus)	0.25% or 1 gal./A	Minimum of 1 gal./A

*Not a dormant oil

¹ The rate of Abacus per 100 gals. is based on a volume of 400 gals./A dilute spray.

² To determine the amount of product per acre for concentrate sprays, first determine the amount that would be required in a full cover dilute spray. Use the same amount of product per acre in concentrate sprays as would be required for the dilute sprays to the same orchard/grove. This may result in use of less than 10 fl. oz./A on small trees.

Application Instructions

- Abacus may be applied using conventional dilute or concentrate ground sprayers calibrated to deliver sufficient water for thorough coverage. Gallonage of spray will vary with size and number of trees per acre and density of foliage. In any case, thorough coverage is essential for good spider mite and insect control.
- For best results, apply in combination with horticultural spray oil (not a dormant oil) as directed. Applications without horticultural spray oil* may result in reduced efficacy and/or residual control.
- Do not graze treated orchards.
- For best results, use Abacus in combination with a horticultural spray oil* approved for use on apples. Apply Abacus when spider mite or insect thresholds are reached. A second application may be made if necessary to maintain control.
- **White Apple Leafhopper (Not for use west of the Rocky Mountains):** Application of Abacus is limited only to first generation white apple leafhopper. Apply soon after petalfall in combination with horticultural spray oil*.

- **Spider Mites:** For best results, apply before a threshold of 5 spider mites per leaf is reached. Residual spider mite control with Abacus in combination with Horticultural spray oil* is greater from spray deposits on newer leaves compared to older. Applications of Abacus for spider mite control should be limited to a period extending from petalfall through six weeks following petalfall.
- **Tentiform Leafminers:** For best results, apply against egg (to control new hatch) and early sap feeder stages of first and second generation tentiform leafminers when locally established thresholds have been reached. Do not apply during bloom.

Use Restriction - Apples

- Do not exceed 20 fl. oz. of this product or any other foliarly applied abamectin containing product per acre per application or 40 fl. oz./A in a growing season.
- Do not make more than 2 applications per growing season of this product or any other foliarly applied abamectin containing product.
- Do not apply in less than 40 gals. of water per acre.
- If a second application is necessary, do not retreat within 21 days.
- Do not apply within 28 days of harvest.
- Do not apply by aircraft.
- Abacus in combination with horticultural spray oil* may cause fruit injury to certain varieties of apples, e.g., russetting on light-skinned varieties such as Golden Delicious, when used alone or when other products are applied sequentially. The Directions for Use and Precautions on horticultural spray oil labels, as well as precautions in official spray guides should be followed carefully when using Abacus in combination with horticultural spray oil (not a dormant oil).
- Do not graze treated orchards.

Avocados: For control of Avocado thrips

Avocados APPLICATION RATES

Pests	fl. oz. Abacus/A
Avocado Thrips (<i>Scirtothrips perseae</i>)	10.0 - 20.0 Do not use less than 10 fl. oz. of Abacus/A
Horticultural oil (not a dormant oil)	Minimum 1 to 4% v/v

Application Instructions

Note: Abacus may be applied using ground application equipment or aircraft. Aerial application is permitted because of its importance to the avocado growing industry. However, aerial application is not the preferred method of application for the best control of thrips. With aerial application, spray coverage and the resulting control of thrips is less than with ground application. For this reason, the user accepts all liability for the level and duration of control of thrips when Abacus is aerially applied.

Gallons of spray will vary with size and number of trees per acre and density of foliage. In any case, thorough coverage is essential for good mite and insect control.

- For best results, apply when immature thrips are first observed but before numbers exceed 5 immature thrips per leaf/fruit. Use 10-15 fl. oz. of product/A for low* to moderate* infestations and 15-20 fl. oz. of product/A for high* or severe* infestations. Add a 1.0% - 4% NR (narrow range) 415 oil in combination with a horticultural spray oil (not a dormant oil) approved for use on avocados.
- Make a second application, if needed, to maintain control, but wait at least 30 days after the first application to retreat. **(See Use Restrictions)**

- **For Ground Application:** If spray volume is greater than 400 gals./A, apply Abacus at a rate of 2.5 fl. oz. per 100 gals. of water plus 1.0% - 4.0% of an NR 415 oil.

Note: To prevent crop injury, observe all precautions and restrictions on the oil label. When using oil concentrations above 2.0% treat a small test area before making a large-scale application.

*Thrips Infestation Level	Number of immature thrips per leaf/fruit
Low	1 - 2
Moderate	3 - 4
High/Severe	More than 5

Use Restrictions - Avocados

- Do not apply within 14 days of harvest.
- Ground and aerial application permitted.
- Do not apply in less than 100 gals. of water with ground equipment or 50 gals. of water with aircraft.
- Do not apply more than 20 fl. oz./A per application of this product or any other foliarly applied abamectin containing product.
- Wait at least 30 days before repeating application.
- Do not make more than 2 applications per season of this product or any other foliarly applied abamectin containing product.
- Do not apply more than 40 fl. oz./A per season of this product or any other foliarly applied abamectin containing product.
- Do not allow livestock to graze in treated orchards.

Celeriac (*Apium graveollens*): For control of two-spotted spider mites

Celeriac	APPLICATION RATE
Pests	fl. oz. Abacus/A
Two-spotted spider mites	16.0

Application Instructions - Celeriac

- Abacus may be applied using conventional or concentrate sprayers calibrated to deliver sufficient water for thorough coverage of the foliage.
- For best results, use in combination with a non-ionic surfactant.
- Apply when mites first appear and repeat as necessary to maintain control.

Use Restrictions - Celeriac

- Do not apply at less than 7-day intervals.
- Do not exceed 48 fl. oz./A after transplanting of this product or any other foliarly applied abamectin containing product per growing season.
- Do not apply within 7 days of harvest.
- Do not apply in less than 20 gals. of water per acre.
- For resistance management purposes, use no more than 2 sequential applications of this product or any other foliarly applied abamectin containing product.
- Ground Application Only

Citrus Fruit Crops (Crop Group 10): Crops in this group are: Calamondin, Citrus citron, Citrus hybrids (includes chironja, tangelo, tangor), Grapefruit, Kumquat, Lemon, Lime, Mandarin (tangerine), Sour orange, Sweet orange, Pummelo, and Satsuma mandarin.

For control of Asian citrus psyllid, Broad mite, Citrus bud mite, Citrus leafminer, Citrus rust mite, Citrus thrips, and Twospotted spider mite

Citrus Fruit Group APPLICATION RATES

Pests	For Dilute Sprays¹ fl. oz. Abacus/100 gals.	For Concentrate Sprays² fl. oz. Abacus/A	Instructions
Asian citrus psyllid	--	10-20 ³	<ul style="list-style-type: none"> • Apply Abacus with a minimum of 0.20% horticultural spray oil* in the spray mixture or not less than 1.0 gal. of oil/A (except when specified differently below). • Asian Citrus Psyllid: Apply Abacus to protect newly expanding foliage flush during the spring, summer or fall. Abacus will only control adults and nymphs present at the time of application. • Mites: Apply when mites first appear during spring, summer, and/or fall. • Citrus Bud Mite: For best results, time the spray at "bud swell." • Citrus Leafminer: Apply to protect new growth during spring, summer, or fall. • Citrus Thrips: Application targeted for citrus thrips
Broad mite	1.0-2.0	10-20 ³	
Citrus bud mite	1.0-2.0	10-20 ⁴	
Citrus leafminer	--	5-20 ³	
Citrus rust mite	0.5-2.0	5-20 ³	
Citrus thrips	--	10-20 ⁵	
Two-spotted spider mite	1.0-2.0	10-20	

¹ The rate of Abacus per 100 gals. is based on a volume of 1,000 gals./A dilute spray.

² For concentrate sprays, adjust the dosage to apply an amount /A equal to that used in full cover dilute spray.

³ Ground Application: For best results, use 150 - 300 gals./A of spray mix with a minimum of 3 gal./A of horticultural spray oil* and apply at a ground speed of 1 to 1.5 mph.

⁴ For best results, use 500 gals./A of spray mix with a minimum of 0.5% horticultural spray oil*.

⁵ For best results, use 100-250 gals./A of spray mix applied to achieve outside coverage.

* Not a dormant oil

Ground Instructions

Apply using conventional dilute or concentrate ground sprayers calibrated to deliver sufficient water for thorough coverage (or outside coverage for citrus leafminers and citrus thrips).

Aerial Application

Thorough spray coverage is essential for good mite and insect control. Spray gallonage may vary depending on size and number of trees per acre as well as density of foliage.

Use Restrictions – Citrus Fruit Crop Group

- **PHI:** Do not apply within 7 days of harvest.

- **Application Method:**

To control citrus leafminer – Ground or aerial application is permitted; however, do not apply with aircraft to citrus in California. For Aerial application use a minimum of 10 gallons of finished spray volume per acre. Under

conditions such as high pest populations, dense foliage, or adverse application conditions (such as high temperatures) use a greater volume of water to insure adequate coverage.

All Other Pests – Ground application only. Do not apply with aircraft.

- **Prohibited Use:** To manage resistance do not use in citrus nurseries.
- **Application Interval:** Wait at least 30 days before repeating application.
- **Maximum Amount per Season:**
Do not apply more than 40 fl. oz./A (or 0.047 lb. ai./A) of this product or any other foliarly applied abamectin containing product in any growing season.
Do not make more than 3 applications in any growing season.
- **Grazing:** Do not allow livestock to graze in treated orchards.

Cotton: For control of two-spotted spider mites, carmine spider mites, Pacific spider mites, and strawberry spider mites.

Cotton		APPLICATION RATES	
Spider Mites	fl. oz. Abacus /A		
	Mid-season/Lay-by	Early Season	
Two-spotted Carmine Pacific Strawberry	8-16	4-6	

Application Instructions - Cotton

Abacus is an emulsifiable concentrate which, when mixed with water according to the Directions for Use will control spider mites (two-spotted, carmine, Pacific and strawberry) on cotton.

- Use 8-16 fl. oz. of Abacus per acre depending on size of the plant and density of the foliage.
- Apply with ground sprayers or aurally by fixed-wing aircraft or helicopter in a minimum of 5 gals. of water per acre to provide thorough coverage.
- Begin application when mites are first noticed and repeat if necessary.
- For use on early season cotton, apply when cotton is under 10 inches in height. Apply at a rate of 4-6 fl. oz. of Abacus per acre by ground equipment only. Do not use less than 4 fl. oz./A.

Use Restrictions - Cotton

- **PHI:** Do not apply within **20 days** of harvest.
- **Application Method:** Ground or aerial application is permitted.
- **Minimum Amount of Water:** Do not apply in fewer than 5 gallons of water per acre. Use sufficient volume to insure thorough coverage.
- **Maximum Amount per Application:** Do not apply more than 16 fl. oz./A (0.019 lb. ai/A) of Abacus or any other foliarly applied abamectin containing product.
- **Application Interval:** Wait at least 21 days before repeating application.
- **Maximum Amount per Season:** Do not apply more than 32 fl. oz./A (0.038 lb. ai/A) of this product or any other foliarly applied abamectin containing product per season.
- **Grazing Restriction:** Do not feed or allow livestock to graze treated cotton.

Cucurbits (Crop Group 9): (Chayote, Chinese Waxgourd, Citron Melon, Cucumbers, Gherkin, Edible Gourds (including: hyotan, cucuzza, hechima, Chinese okra); *Momordica spp.* (including: balsam, apple, balsam pear, bittermelon, Chinese cucumber); Muskmelon, Cantaloupe, Pumpkin, Summer Squash, Winter Squash, (Squash includes: butternut squash, calabaze, hubbard squash, acorn squash, spaghetti squash); Watermelon).

For control of spider mites and leafminers

Cucurbits		APPLICATION RATES
Pests	fl. oz. Abacus/A	
Spider mites Leafminers	8.0 - 16.0	

Application Instructions

- Mix with water as indicated below and apply thoroughly by ground or air as a foliar spray to ensure good upper and lower leaf coverage.
- Use 8 fl. oz./A for low to moderate infestations and 16 fl. oz./A for severe infestations.
- Apply when adult leafminer flies or spider mites are first observed and repeat applications as necessary to maintain control within constraints of a sound resistance management program.

Use Restrictions - Cucurbits

- Do not exceed 48 fl. oz./A in a growing season of this product or any foliarly applied abamectin containing product.
- Do not apply within 7 days of harvest.
- Do not apply at less than 7-day intervals.
- Do not apply in less than 20 gals. of water per acre by ground or less than 5 gals. of water by air.
- Do not make more than 2 sequential applications of this product or any foliarly applied abamectin containing product.
- Do not apply by aircraft in New York State.

Dry Beans: Crops include: *Cicer arietinum* (chickpea, garbanzo bean), *Lupinus* spp. (including sweet lupine, white sweet lupine, white lupine, and grain lupine), *Phaseolus* spp. (including kidney bean, lima bean, mung bean, navy bean, pinto bean, snap bean, and waxbean), *Vicia faba* (broad bean, fava bean), and *Vigna* spp. (including adzuki bean, asparagus bean, blackeyed pea, catjang, Chinese longbean, cowpea*, crowder pea, moth bean, mung bean, rice bean, southern pea, urd bean, and yardlong bean)

*For use on cowpeas that are grown only for dry seed. Do not allow livestock to graze cowpea forage and do not harvest cowpea forage or hay for use as livestock feed.

For control of *Liriomyza* leafminers and Spider Mites

Mix with water as indicated below. Thorough coverage of the crop canopy is essential for optimum results. Inadequate coverage can result in reduced control.

Note:

- Apply ABACUS® Agricultural Miticide/Insecticide with ground equipment or aircraft.
- For best control apply ABACUS® Agricultural Miticide/Insecticide with ground application equipment. With aerial application, the resulting control of leafminers and spider mites could be less than with ground application.

Dry Beans

Pest	fl. Oz./A.	Instructions
<i>Liriomyza</i> leafminers Spider mites	8.0-16.0	<ul style="list-style-type: none"> • Use 8 - 12 fl. oz./A for low to moderate infestations and 13 - 16 fl. oz./A for high infestations. • Leafminers and Spider Mites: Apply when adult leafminer flies or spider mites are first observed and repeat application, as needed, to maintain control within constraints of a sound resistance management program. (See Use Restrictions.)

Use Restrictions – Dry Beans

- **PHI:** Do not apply within **7 days** of harvest (7-day PHI).
- **Application Method:** Ground or aerial application permitted; however, do not apply with aircraft in New York State.
- **Amount of Water:** Do not apply in less than 10 gal. of water/A with ground application equipment. Do not apply in less than 5 gal. of water/A with aircraft. Under conditions such as high pest populations, dense foliage, or adverse application conditions (such as high temperatures), use a greater volume of water to ensure adequate coverage.
- **Maximum Amount per Application:** Do not apply more than 16 fl. oz./A (or 0.019 lb. a.i./A) of this product or any other foliarly applied abamectin-containing product per application.
- **Application Interval:** Wait at least 6 days before repeating application.
- **Number of Applications:** Do not make more than 2 sequential applications of this product or any other foliarly applied abamectin-containing product.
- **Maximum Amount per Season:** Do not apply more than 48 fl. oz./A (or 0.056 lb. a.i./A) of this product or any other foliarly applied abamectin containing product in a growing season.

Fruiting Vegetables Crops (Crop Group 8): Crops in this group are: Eggplant, Groundcherry, Pepino, Peppers (includes bell pepper, chili pepper, cooking pepper, pimento, sweet pepper), Tomatillo, and Tomato

For control of Broad mite, Colorado potato beetle, *Liriomyza* leafminers, Spider mites, *Thrips palmi*, Tomato psyllid, Tomato pinworm, and Tomato russet mite.

Mix with water as indicated below. Thorough coverage of the crop canopy is essential for optimum results. Inadequate coverage may result in reduced control.

Note: Abacus may be applied with ground application equipment or aircraft.

For best control of mites, apply Abacus with ground application equipment. With aerial application, spray coverage and the resulting control of mites is less than with ground application. For this reason, the user accepts all liability for the level and duration of control of mites when Abacus is aerially applied.

Fruiting Vegetables APPLICATION RATES

Pests	fl. oz. Abacus/A	Instructions
Broad mite Colorado potato beetle <i>Liriomyza</i> leafminers Spider mites Thrips palmi Tomato Psyllid Tomato Russet mite	8.0 – 16.0	<ul style="list-style-type: none"> • Broad, russet, and spider mites: Apply when mites first appear. • Thrips palmi: Apply when thrips are first observed. • Tomato pinworm: Application may be made from the time moth activity is detected up to, but no later than, the time when newly emerged larvae are present. • Leafminers: apply when adult flies are first observed. • Mites, leafminers, Thrips palmi, and Colorado potato beetle: Use 8 fl. oz./A for low to moderate infestations and 16 fl. oz./A for severe infestations. • Repeat application as necessary to maintain control. (See Use Restrictions.) • Note: Abacus may be used without a wetting agent. Spreading and penetrating surfactants can improve insect control when necessary to improve the wetting of foliage and to smooth out spray deposits, a nonionic surfactant is recommended. Do not use binder or sticker-type surfactants.
Tomato pinworm	16.0	

Use Restrictions – Fruiting Vegetables

- **PHI:** Do not apply within 7 days of harvest.
- **Application Method:** Ground or aerial application permitted; however **do not apply with aircraft in New York State.**
- **Prohibited Use:** For resistance management, do not use on fruiting vegetables grown for transplanting.
- **Amount of Water:** Do not apply in less than 20 gals. of water/A with ground application equipment. Do not apply in less than 5 gals. of water/A with aircraft. Under conditions such as high pest populations, dense foliage, or adverse application conditions (such as high temperatures) use a greater volume of water to insure adequate coverage.
- **Maximum Amount per Application:** **Do not** apply more than 16 fl. oz./A (or 0.019 lb. ai/A) of this product or any other foliarly applied abamectin containing product per application.
- **Application Interval:** Wait at least 7 days before repeating application
- **Number of Applications:** Do not make more than 2 sequential applications of this product or any other foliarly applied abamectin containing product.
- **Maximum Amount per Season:** Do not apply more than 48 fl. oz./A (or 0.056 lb. ai/A) of this product or any other foliarly applied abamectin containing product in a growing season.

Grapes

For control of Pacific spider mite, Twospotted spider mite, Variegated leafhopper, Western grape leafhopper, Western grapeleaf skeletonizer, and Willamette spider mite

Abacus may be applied using conventional ground sprayers calibrated to deliver sufficient water for thorough coverage. Thorough coverage is essential for good spider mite and insect control. Do not spray alternate rows. Abacus must be applied to both sides of each row for maximum coverage.

Grapes		APPLICATION RATES
Pests	fl. oz. Abacus/A	Instructions
Pacific spider mite Two-spotted spider mite Variegated leaf hoppers Wester grape leafhopper Western grapeleaf skeletonizer Willamette spider mite	8.0 - 16.0 Plus a nonionic surfactant	<ul style="list-style-type: none"> • Use 8 – 12 fl. oz./A for low to moderate infestations and 16 fl. oz. for severe infestations. • Repeat application, if needed. (See Use Restrictions.) • Note: Abacus must be applied in combination with a nonionic surfactant to improve wetting of foliage and to smooth out spray deposits. Spreading and penetrating surfactants can improve insect control. Do not use binder or sticker-type surfactants. Although Abacus has been tested in combination with a nonionic surfactant for safety to grapes, it is impossible to test on all grape varieties under the variety of conditions that may cause crop injury. Therefore, when using Abacus in combination with a nonionic surfactant, carefully follow the Directions for Use and Precautions on the nonionic surfactant label and in official spray guides. • Spider mites: Apply when mites first appear but before motiles exceed 5 per leaf. • Western grapeleaf skeletonizer: Apply Abacus plus a nonionic For optimum control, apply shortly after egg hatch. • Leafhoppers: Apply Abacus plus a nonionic surfactant using thorough spray coverage for contact knock-down only.

Use Restrictions - Grapes

- **PHI:** Do not apply within **28 days** of harvest.
- **Application Method:** Ground application only.
- **Amount of Water:** Do not apply in less than 50 gals. of water/A with conventional ground application equipment. When using an electro-static sprayer, less than 50 gals. of water/A may be used , however do not use less than 5 gals. of water/A.
- **Maximum Amount per Application:** Do not apply more than 16 fl. oz./A (or 0.019 lb. ai./A) of this product or any other foliarly-applied abamectin containing product per application.
- **Application Interval:** If a second application is necessary, wait at least 21 days before repeating application.
- **Number of Applications:** Do not make more than 2 applications of this product or any other foliarly-applied abamectin containing product per growing season.
- **Maximum Amount per Season:** Do not apply more than 32 fl. oz./A (0.038 lb. ai./A) of this product or any other foliarly-applied abamectin containing product.
- **Grazing:** Do not allow livestock to graze in treated vineyards.
- Do not enter or allow worker entry into treated areas during the restricted-entry interval (REI) of 12 hours. **Exception:** For grape girdling, cane turning, and tying in grapes, do not enter or allow worker entry into treated areas during restricted-entry interval (REI) of 4 days.

Herb Crop Subgroup (Crop Subgroup 19A): Crops in this subgroup are: Angelica, Balm, Basil, Borage, Burnet, Camomile, Catnip, Chervil (dried), Chives, Chives (Chinese), Clary, Coriander (leaf), Cilantro (leaf), Costmary, Culantro (leaf), Curry (leaf), Dill weed, Horehound, Hyssop, Lavender, Lemongrass, Lovage (leaf), Marigold, Marjoram (*Origanum* species), Nasturtium, Parsley (dried), Pennyroyal, Rosemary, Rue, Sage, Summer and Winter savory, Sweet bay, Tansy, Tarragon, Thyme, Wintergreen, Woodruff, and Wormwood.

For control of *Liriomyza* leafminers and Spider Mites

Mix with water as indicated below. Apply thoroughly with ground application equipment as a foliar spray and ensure good upper and lower leaf coverage.

Herbs (Crop Subgroup 19A)

Pest	fl. oz./A.	Instructions
<i>Liriomyza</i> leafminers Spider Mites	8.0-16.0	<p>Use 8 fl. oz./A for low to moderate infestations and 16 fl. oz./A for severe infestations.</p> <ul style="list-style-type: none"> • Apply when adult leafminer flies or spider mites are first observed and repeat application, as necessary to maintain control. (See Use Restrictions.) • ABACUS® Agricultural Miticide/Insecticide may be used without a wetting agent. When necessary to improve the wetting of foliage and to smooth out spray deposits, a nonionic surfactant is recommended for all crops in the Herb Crop Subgroup except chives. Do not use a surfactant when applying this product to chives. • Note: Although ABACUS® Agricultural Miticide/Insecticide has been tested in combination with a nonionic surfactant for safety to herbs, it is impossible to test on all herb types and varieties under the variety of conditions that may cause crop injury. Therefore, when using ABACUS® Agricultural Miticide/Insecticide in combination with a nonionic surfactant, carefully follow the Directions for Use and Precautions on the nonionic surfactant label and in official spray guides.

Use Restrictions – Herb Crop Subgroup (Crop Subgroup 19A)

- **PHI:** Do not apply within **14 days** of harvest. For chives, do not apply within **7 days** of harvest.
- **Application Method:** Apply with ground application equipment.
- **Amount of Water:** Use a minimum of 20 gal. of water/A.
- **Maximum Amount per Application:** Do not apply more than 16 fl._oz./A (or 0.019 lb. a.i./A) of ABACUS® Agricultural Miticide/Insecticide or any other foliarly applied abamectin-containing product per application.
- **Application Interval:** Wait at least 7 days before repeating application.
- **Number of Applications:** Do not make more than 2 applications of this product or any other foliarly applied abamectin containing product per single cutting (harvest).
- **Maximum Amount per Season:** Do not apply more than 48 fl oz./A (or 0.056 lb. a.i./A) of this product or any other foliarly applied abamectin containing product per year.

Hops*

For control of two-spotted spider mites

Hops	APPLICATION RATE
Pests	fl. oz. Abacus/A
Two-spotted spider mites	8.0 - 16.0

Application Instructions - Hops

- Apply Abacus when two-spotted spider mites reach treatment thresholds.
- Mix with water as indicated below and apply by ground equipment as a foliar spray to assure good upper and lower coverage.
- Gallonage of spray may vary with the size of plants and density of foliage. In any case, thorough coverage is essential for good control of two-spotted mites. When using concentrate sprays, the amount of water is reduced, but the amount of Abacus per acre should remain the same as for dilute sprays.
- If a second application is necessary for control, do not retreat within 21 days of the first application and only after an alternative miticide with a different mode of action has been used.

Use Restriction - Hops

- Do not use less than 16 fl. oz. per application or exceed 32 fl. oz./A per growing season of this product or any other foliarly applied abamectin containing product.
- Do not apply within 28 days of harvest.
- Do not apply in less than 40 gals. of water per acre.
- If a second application is necessary to maintain control, do not retreat within 21 days of the first application.
- Do not apply by aircraft.
- Do not permit livestock to graze treated hop yards.

*Not registered for use in California.

Note: Abacus may be used without any wetting agent. When necessary to improve the wetting of foliage and to smooth out spray deposits, a nonionic surfactant is recommended.

Leafy Vegetables (except *Brassica* vegetables) Crop Group

(Crop Group 4) Crops in this group are: Amaranth (leafy amaranth, Chinese spinach, tampala); Arugula (Roquette); Cardoon; Celery; Celtuce; Chervil; Chinese celery; Chrysanthemum, edible leaved and garland; Corn salad; Cress, garden and upland (yellow rocket and winter cress); Dandelion; Dock (Sorrel); Endive (escarole); Florence fennel; Lettuce, head and leaf; New Zealand Spinach; Orach; Parsley; Purslane, garden and winter; Radicchio (red chicory); Rhubarb; Spinach: Vine spinach: and Swiss chard.

For Control of Carmine spider mite, *Liriomyza* leafminers, and Twospotted spider mite

Leafy Vegetables	APPLICATION RATE
Pests	fl. oz. Abacus/A
<i>Carmine spider mite Liriomyza</i> leafminers Twospotted spider mite	8.0 - 16.0 Plus a nonionic surfactant

Application Instructions

- Mix with water as indicated below. Thorough coverage of the crop canopy is essential for optimum results. Inadequate coverage may result in reduced control.

Note: Abacus may be applied with ground application equipment or aircraft. For best control of mites, apply Abacus with ground application equipment. With aerial application, spray coverage and the resulting control of mites is less than with ground application. For this reason, the user accepts all liability for the level and duration of control of mites when Abacus is aerially applied.

- Use 8 - 12 fl. oz./A for low to moderate infestations and 16 fl. oz./A for severe infestations.
- **Spider mites:** Apply when mites first appear, and repeat as needed to maintain control. **(See Use Restrictions)**
- **Leafminers:** Apply when adult flies are first observed and repeat applications as needed to maintain control. **(See Use Restrictions)**

Note: Abacus may be used without a wetting agent. Spreading and penetrating surfactants can improve insect control. When necessary to improve the wetting of foliage and to smooth out spray deposits, a nonionic surfactant is recommended. Do not use binder or sticker-type surfactant

Use Restrictions – Leafy Vegetables

- Do not apply within 7 days of harvest.
- Ground or aerial application permitted; however **do not apply with aircraft in New York State.**
- For resistance management, do not use on leafy vegetables grown for transplanting.
- Do not apply in less than 20 gals. of water/A. with ground application equipment. Do not apply in less than 5 gals. of water per acre with aircraft. Under conditions such as high pest populations, dense foliage, or adverse application conditions (such as high temperatures) use a greater volume of water to insure adequate coverage.
- Wait at least 7 days before repeating application.
- Do not make more than 2 sequential applications of this product or any foliarly applied abamectin containing product.
- Do not apply more than 48 fl. oz./A. per growing season of this product or any other foliarly applied abamectin containing product.

Mint (peppermint and spearmint)

For control of Twospotted spider mite

Mint	APPLICATION RATE
Pests	fl. oz. Abacus/A
Two-spotted spider mites	8.0 – 12.0

Application Instructions

- Mix with water as indicated below. Thorough coverage of the crop canopy is essential for optimum results. Inadequate coverage may result in reduced control.
- Treat when mites first appear.
- For optimum control, a nonionic surfactant or organosilicone-based surfactant should be used at the manufacturer's recommended rate.

Use Restrictions - Mint

- Do not apply within 28 days of harvest.
- Ground or aerial application permitted; however **do not apply with aircraft in New York State.**
- Do not apply in less than 20 gals. of water/A with ground application equipment. Do not apply in less than 5 gals. of water/A with aircraft. Under conditions such as high pest populations, dense foliage, or adverse application conditions such as high temperatures, use a greater volume of water to insure adequate coverage.
- Do not apply more than 12 fl. oz/A per application of this product or any foliarly applied abamectin containing product.

- Wait at least 7 days before repeating application.
- Do not make more than 2 sequential applications and do not apply more than 3 applications per season of this product or any other foliarly applied abamectin containing product.
- Do not apply more than 36 fl. oz./A per crop per season of this product or any other foliarly applied abamectin containing product.
- Do not allow livestock to graze or feed treated foliage to livestock.

Onion, bulb (Crop Subgroup 3-07A)

Crops in this group are: onion, bulb, including daylily, bulb; fritillaria, bulb; garlic, bulb; garlic, great-headed, bulb; garlic, serpent, bulb; lily, bulb; onion, Chinese, bulb; onion, pearl; onion, potato, bulb; shallot, bulb; cultivars, varieties, and/or hybrids of these.

For control of *Liriomyza* Leafminers and Thrips

Mix with water as indicated below. Thorough coverage of the crop canopy is essential for optimum results. Inadequate coverage can result in reduced control.

Note:

- Apply ABACUS® Agricultural Miticide/Insecticide with ground application equipment or aircraft.
- For best control apply ABACUS® Agricultural Miticide/Insecticide with ground application equipment. With aerial application, the resulting control of leafminers and thrips could be less than with ground application.

Onion, Bulb (Crop Subgroup 3-07A)

Pest	fl. oz./A.	Instruc
<i>Liriomyza</i> leafminers Thrips	8.0-16.0	<ul style="list-style-type: none"> • Use 8 - 12 fl. oz./A for low to moderate infestations and 13 - 16 fl. oz./A for high infestations. • Leafminers: Apply when adult leafminer flies are first observed and repeat application, as needed, to maintain control within constraints of a sound resistance management program. (See Use Restrictions.) • Thrips: Apply in a thrips management program and when thrips are at economic threshold. Repeat application, as needed, to maintain control within constraints of a sound resistance management program. (See Use Restrictions.) Do not use ABACUS® Agricultural Miticide/Insecticide as a rescue treatment for thrips control. • Note: Add a non-ionic activator type wetting, spreading and/or penetrating adjuvant approved for use on bulb onion. Do not use binder sticker type adjuvants. Tank mixing with products that have binder sticker type formulations can reduce ABACUS® Agricultural Miticide/Insecticide performance. (See Use Information and Use Restrictions.)

Use Restrictions – Onion, Bulb (Crop Subgroup 3-07A)

- **PHI:** Do not apply within **30 days** of harvest.
- **Application Method:** Ground or aerial application permitted; however, do not apply with aircraft in New York State.
- **Amount of Water:** Do not apply in less than 20 gal. of water/A with ground application equipment. Do not apply in less than 5 gal. of water/A with aircraft. Under conditions such as high pest populations, dense foliage, or adverse application conditions (such as high temperatures), use a greater volume of water to ensure adequate coverage.
- **Maximum Amount per Application:** Do not apply more than 16 fl. oz./A (or 0.019 lb. a.i./A) of this product or any other foliarly applied abamectin containing product per application.
- **Application Interval:** Wait at least 7 days before repeating application.
- **Number of Applications:** Make 2 consecutive applications of ABACUS® Agricultural Miticide/Insecticide then rotate to a chemistry with a different mode of action. Make at least 2 applications of a chemistry with a different mode of action before making additional ABACUS® Agricultural Miticide/Insecticide applications. Do not make more than 2 sequential applications of this product or any other foliarly applied abamectin containing product.
- **Maximum Amount per Season:** Do not apply more than 48 fl. oz./A (or 0.056 lb. a.i./A) of this product or any other foliarly applied abamectin containing product in a growing season.

Pears (including oriental pear trees)

For control of two-spotted spider mites, McDaniel spider mites, European red mites, pear rust mites, yellow mites, and pear psylla (Ground Application Only).

Pears		
APPLICATION RATES		
Pests	For Dilute Sprays¹	For Concentrate Sprays²
Two-spotted spider mite McDaniel spider mite European red mite Pear rust mite	2.5-5.0	10-20
Pear psylla	2.5-5.0	10-20
Horticultural Spray Oil*	0.25%	Minimum of 1 gal./A

*Not a dormant oil

¹ The rate of Abacus per 100 gals. is based on a volume of 400 gals./A dilute spray.

² To determine the amount of product per acre for concentrate sprays, first determine the amount that would be required in a full cover dilute spray. Use the same amount of product per acre in concentrate sprays as would be required for the dilute sprays to the same orchard/grove. This may result in use of less than 10 fl. oz./A on small trees.

Application Instructions

- Abacus may be applied using conventional dilute or concentrate ground sprayers calibrated to deliver sufficient water for thorough coverage. Gallonage of spray will vary with size and number of trees per acre and density of foliage. In any case, thorough coverage is essential for good spider mite and insect control.
- Always apply in combination with horticultural spray oil (not a dormant oil) as directed. Do not graze treated orchards.
- Use Abacus with a minimum of 0.25% horticultural spray oil (not a dormant oil) in the dilute spray mixture and not less than 1.0 gal. of horticultural spray oil (not a dormant oil) per acre in the final finished spray.

Use Restrictions - Pear

- Do not exceed 20 fl. oz. of Abacus per acre per application or 40 fl. oz./A in a growing season of this product or any foliarly applied abamectin containing product.
- Do not make more than 2 applications per growing season of this product or any foliarly applied abamectin containing product.
- Do not apply less than 40 gals. of water per acre.
- If a second application is necessary, do not retreat within 21 days of the first application.
- Do not apply within 28 days of harvest.
- Do not apply by aircraft.
- Do not graze treated orchards.

Stone Fruit Crop Group (Crop Group 12)

Crops in this group are: apricot, cherry (sweet and tart); nectarine; peach; plum; plum (chickasaw, damson, and Japanese); plumcot, and prune (fresh)

For control of European spider mite, Pacific spider mite, and Twospotted spider mite

Abacus may be applied using conventional dilute or concentrate sprayers calibrated to deliver sufficient water for thorough coverage. Gallons of spray will vary with size and number of trees per acre and density of foliage. In any case, thorough coverage is essential for good spider mite control.

Stone Fruit Crop Group – APPLICATION RATES

Pests	For Dilute Sprays ¹ fl. oz. Abacus/ 100 gals.	For Concentrate Sprays ² fl. oz. Abacus/A	Instructions
European red mite Pacific Spider Mite Two-spotted spider mite	2.5-5.0	10-20	<p>- Apply when mites first appear.</p> <p>- A second application may be made, if needed, to maintain control. (See Use Restrictions)</p> <p>- Always apply Abacus in combination with a nonionic surfactant that spreads on and/or penetrates the leaf cuticle, or apply with horticultural spray oil (not a dormant oil).</p> <p>- NOTE:</p> <p>1) A nonionic surfactant that spreads on and/or penetrates the leaf cuticle can improve insect control. Although Abacus has been tested in combination with nonionic surfactants for safety to stone fruit, it is impossible to test on all stone fruit varieties under the variety of conditions that may cause crop injury. Therefore, when using Abacus in combination with a non-ionic surfactant, carefully follow the Directions for Use and Precautions on the surfactant label and in official spray guides.</p>

Stone Fruit Crop Group (Cont'd.)

Pests	For Dilute Sprays ¹ fl. oz. Abacus/ 100 gals.	For Concentrate Sprays ² fl. oz. Abacus/A	Instructions
Horticultural Spray Oil (not a dormant oil) OR Nonionic Surfactant	0.25% or 1 gal./A Labeled Rate	Minimum of 1 gal/A	<p><i>(continued)</i></p> <p>2) A horticultural oil (not a dormant oil) may improve efficacy and can be used but it may increase the possibility of phytotoxicity to foliage and fruit.</p> <p>- Use nonionic surfactants at the manufacturer's recommended rate.</p> <p>- Use a minimum of 0.25% horticultural spray oil (not a dormant oil) in the dilute spray mixture and not less than 1.0 gal. of horticultural spray oil per acre in the final finished spray.</p>

¹ The rate of Abacus per 100 gals. Is based on a volume of 400 gals./A dilute spray.

² To determine the amount of product per acre for concentrate sprays, first determine the amount that would be required in a full cover dilute spray. Use the same amount of product per acre in concentrate sprays as would be required for the dilute sprays to the same orchard/grove. This may result in use of less than 10 fl. oz./A on small trees.

Use Restrictions – Stone Fruit Crop Group

- **PHI:** Do not apply within 21 days of harvest
- **Application Method:** Ground application only. Do not apply with aircraft.
- **Amount of Water:** Do not apply in less than 40 gals. of water per acre.
- **Application Interval:** If a second application is necessary, do not retreat within 21 days.
- **Maximum Amount per Application:** Do not apply more than 20 fl. oz./A (or 0.023 lb. ai./A) of this product or any other foliarly applied abamectin containing product per application.
- **Applications per Season:** Do not make more than 2 applications of this product or any other foliarly applied abamectin containing product in a growing season.
- **Maximum Amount per Season:** Do not apply more than 40 fl. oz./A (0.047 lb. ai./A) of this product or any other foliarly applied abamectin containing product in a growing season.
- **Grazing:** Do not allow livestock to graze in treated groves/orchards.

Strawberries

For control of two-spotted spider mites

Strawberries APPLICATION RATES

Pests	fl. oz. Abacus/A
Two-spotted spider mites	16.0

Application Instructions

- Adjust spray volume and nozzle placement to assure maximum coverage of tops and undersides of leaves.
- Use 16 fl. oz. of Abacus per acre. Make 2 applications 7-10 days apart when mites first appear.
- Repeat this sequence of application if necessary to maintain control.

Use Restrictions - Strawberries

- Do not exceed 16 fl. oz./A per application or 64 fl. oz./A in a growing season of this product or any foliarly applied abamectin containing product.
- Do not apply within 3 days of harvest.
- For resistance management purposes, do not use in strawberry nurseries.
- Do not apply in less than 50 gals. of water per acre of this product or any other foliarly applied abamectin containing product.
- Do not repeat treatment within 21 days of second application.
- Do not apply by aircraft.

Note: Abacus may be used without any wetting agent. When necessary to improve the wetting of foliage and to smooth out spray deposits, a nonionic surfactant is recommended

Tree Nuts Crop Group and Pistachio APPLICATION RATES

Pests	For Dilute Sprays ¹ fl. oz. / 100 gals.	For Concentrate Sprays ² fl. oz. /A	Instructions
Two spotted spider mite Pacific spider mite Strawberry spider mite European red mite	2.5-5.0	10-20	- Always use Abacus in combination with a horticultural spray oil (not a dormant oil) approved for use on tree nuts.

Horticultural Spray Oil (not a dormant spray)	0.25% or 1gal./A	Minimum of 1gal./A	- Apply Abacus when spider mites first appear. Residual spider mite control is greater from spray deposits on newer leaves compared to older leaves. - A second application may be made, if needed, to maintain control. (See Use Restrictions)
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¹ The rate of Abacus per 100 gals. is based on a volume of 400 gals./A dilute spray.

² To determine the amount of product per acre for concentrate sprays, first determine the amount that would be required in a full cover dilute spray. Use the same amount of product per acre in concentrate sprays as would be required for the dilute sprays to the same orchard/grove. This may result in use of less than 10 fl. oz./A on small trees.

Use Restrictions – Tree Nuts Crop Group and Pistachio

- **PHI:** Do not apply within 21 days of harvest
- **Application Method:** Ground application only. Do not apply with aircraft.

Tree Nuts Crop Group (Crop Group 14) and Pistachio: Crops in this group are almond, beech nut, Brazil nut, butternut, cashew, chestnut, chinquapin, filbert (hazelnut), hickory nut, macadamia nut, pecan, and walnuts (black and English)

For control of two-spotted spider mite, strawberry spider mite, Pacific spider mite, and European red mite (Ground Application Only).

Abacus may be applied using conventional dilute or concentrate sprayers calibrated to deliver sufficient water for thorough coverage. Gallons of spray will vary with size and number of trees per acre and density of foliage. In any case, thorough coverage is essential for good spider mite and insect control.

- **Amount of Water:** Do not apply in less than 40 gals. of water per acre.
- **Application Interval:** If a second application is necessary, do not retreat within 21 days.
- **Maximum Amount per Application:** Do not apply more than 20 fl. oz./A (or 0.023 lb. ai./A) of this product or any other foliarly applied abamectin containing product per application.
- **Application per Season:** Do not make more than 2 applications of this product or any other foliarly applied abamectin containing product in a growing season.
- **Maximum Amount per Season:** Do not apply more than 40 fl. oz./A (0.047 lb. ai./A) of this product or any other foliarly applied abamectin containing product in a growing season.
- **Grazing:** Do not allow livestock to graze in treated groves/orchards.

Tuberous and Corm Vegetables Crop Subgroup (Crop Subgroup 1C)

Crops in this subgroup are: arracacha; arrowroot; artichoke, Chinese; artichoke, Jerusalem; canna, edible; cassava (bitter and sweet); chayote (root); chufa; dasheen; ginger; leren; potato; sweet potato; tanier; tumeric; yam bean; and yam (true).

For control of Colorado potato beetle, *Liriomyza* leafminers, Potato psyllid, and spider mites

Mix with water as indicated below. Thorough coverage of the crop canopy is essential for optimum results. Inadequate coverage may result in reduced control.

Note: Abacus may be applied using ground application equipment or aircraft. For best control of mites, apply Abacus with ground application equipment. With aerial

application, spray coverage and the resulting control of mites is less than with ground application. For this reason, the user accepts all liability for the level and duration of control of mites when Abacus is aerially applied.

Tuberous and Corm Vegetables Crop Subgroup APPLICATION RATES

Pests	fl. oz. Abacus/A	Instructions
Colorado potato beetles <i>Liriomyza</i> leafminers Potato psyllid Spider mites	8.0-16.0	<ul style="list-style-type: none"> • Use 8 - 12 fl. oz./A for low to moderate infestations and 16 fl. oz./A for severe infestations. • The addition of a nonionic surfactant or organosilicone-based surfactant, at the manufacturer's recommended rate, is suggested for optimum spider mite and insect control. • Insect and spider mite control may be reduced if Abacus is used in combination with a sticker or binder type product such as Bravo® Weather Stik®. • Colorado potato beetle: Make the first application after approximately 50% of the egg masses have hatched and larvae are present. If 2 applications are needed, limit them to a single Colorado potato beetle generation per crop. Do not make more than 2 applications per crop. (See Use Restrictions.) • <i>Liriomyza</i> leafminers: Make the first application when adult flies are first observed. Repeat applications as needed to maintain control. (See Use Restrictions.) • Spider mites: Make the first application when mites first appear. Repeat application as needed to maintain control. (See Use Restrictions.)

Use Restrictions - Tuberous and Corm Vegetables Crop Subgroup

- **PHI:** Do not apply within **14 days** of harvest.
- **Application Method:** Ground or aerial application permitted; however do not apply with aircraft in New York State.
- **Amount of Water:** Do not apply in less than 20 gals. of water with ground application equipment. Do not apply in less than 5 gals. of water/A with aircraft. Under conditions such as high pest populations, dense foliage, or adverse application conditions (such as high temperatures) use a greater volume of water to insure adequate coverage.
- **Maximum Amount per Application:** Do not apply more than 16 fl. oz./A (or 0.019 lb. ai./A) per application.
- **Application Interval:** Wait at least 7 days before repeating application.
- **Number of Applications:** Do not make more than 2 sequential applications of this product or any other foliarly applied abamectin containing product.
- **Maximum Amount per Crop:**
 - For spider mite or Colorado potato beetle control, do not apply more than 32 fl. oz./A (or 0.038 lb. ai./A) of this product or any other foliarly applied abamectin containing product per crop.
 - For leafminer control, do not apply more than 48 fl. oz./A. (or 0.056 lb. ai./A) of this product or any other foliarly applied abamectin containing product per crop.
- **Grazing:** Do not allow livestock to graze or feed treated foliage to livestock.

STORAGE AND DISPOSAL

Do not contaminate water, food, or feed by storage or disposal. Open dumping is prohibited.

Pesticide Storage: Store in a tightly closed container in a cool, dry place.

Pesticide Disposal: Pesticide spray mixture or rinsate that cannot be used should be disposed of in a landfill approved for pesticides. Improper disposal of excess pesticide spray mixture or rinsate is a violation of Federal law. If these wastes cannot be disposed of by the use according to label instructions, contact your State Pesticide or Environmental Control Agency or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

Container Disposal (Nonrefillable Container): Do not reuse this container to hold materials other than pesticides or dilute pesticides (rinsate). After emptying and cleaning, it may be allowable to temporarily hold rinsate or other pesticide-related materials in the container. Contact your state regulatory agency to determine allowable practices in your state. Offer for recycling, if available. If not, dispose of in a sanitary landfill or by burning, if allowed by State law. If burned, keep out of the smoke.

Residue Removal: Triple rinse or pressure rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container ¼ full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Pressure rinse as follows: Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 PSI for at least 30 seconds. Drain for 10 seconds after the flow begins to drip.

FOR CHEMICAL EMERGENCY: Spill, leak, fire, exposure, or accident, call CHEMTREC AT 1-800-424-9300.

ABACUS[®] is a registered trademark of Rotam Group Companies. ROTAM GROUP COMPANIES ©2009

Manufactured by: Rotam Agrochemical Company Ltd.

7/F Cheung Tat Centre

18 Cheung Lee Street

Chai Wan, Hong Kong

[Base Container Label]

RESTRICTED USE PESTICIDE

**TOXIC TO FISH, MAMMALS, AND AQUATIC ORGANISMS
FOR RETAIL SALE TO AND USE ONLY BY CERTIFIED APPLICATORS OR
PERSONS UNDER THEIR DIRECT SUPERVISION, AND ONLY FOR THOSE
USES COVERED BY THE CERTIFIED APPLICATOR'S CERTIFICATION.**

GROUP	6	INSECTICIDE
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ABACUS[®]

Agricultural Insecticide/Miticide

ACTIVE INGREDIENT:

Abamectin (CASRN: 65195-55-3 and 65195-56-4).....	2.0%
Other Ingredients:.....	98.0%
Total:.....	100.0%

*0.15 lb. Abamectin per gallon

EPA Reg. No. 81578 – 4

EPA Est. No.: 069821-CHN-005

See additional precautionary statements and directions for use in booklet.

[Company Logo]

Manufactured by:
Rotam Agrochemical Company Ltd.
7/F Cheung Tat Centre
18 Cheung Lee Street
Chai Wan, Hong Kong

Net Contents: 1.0 GALLON (3.75 Liters)

FIRST AID (Avermectin B1)	
If In Eyes	<ul style="list-style-type: none"> • Hold eye open and rinse slowly and gently with water for 15-20minutes. • Remove contact lenses, if present, after the first 5 minutes, the continue rinsing eye. • Call a poison control center or doctor for further treatment advice.
If Swallowed	<ul style="list-style-type: none"> • Do not induce vomiting unless told to do so by the poison control center or doctor. • Have person sip a glass of water if able to swallow. • Do not give anything by mouth to an unconscious person. • Call poison control center or doctor for treatment advice.
If Inhaled	<ul style="list-style-type: none"> • Move person to fresh air. • If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible.
If On Skin Or Clothing	<ul style="list-style-type: none"> • Take off contaminated clothing. • Rinse skin immediately with plenty of water for 15-20 minutes. • Call a poison control center or doctor for further treatment advice.
Note to Physician	
<p>Recommendations for Medical Treatment for ABACUS (Avermectin B1) Acute Toxicity: Early signs of intoxication include mydriasis (dilated pupils), ataxia (unsteadiness), and muscle tremors. Toxicity follows accidental ingestion of the concentrate and can be minimized by inducing vomiting within one-half hour of exposure.</p> <p>If toxicity from exposure has progressed to cause severe vomiting, the extent of resultant fluid and electrolyte imbalance should be gauged. Appropriate supportive parenteral fluid replacement therapy should be given, along with other required supportive measures (such as maintenance of blood pressure levels) as indicated by clinical signs, symptoms, and measurements.</p> <p>In severe cases, observations should continue for at least several days until clinical condition is stable and normal. Since avermectin is believed to enhance GABA activity in animals, it is probably wise to avoid drugs that enhance GABA activity (barbiturates, benzodiazepines, valproic acid) in patients with potentially toxic avermectin exposure.</p>	
(Avermectin B1)	
<p>Have the product container or label with you when calling a poison control center or doctor or going for treatment.</p> <p>For Medical Emergency treatment, call your Local Poison Control Center for assistance.</p>	

KEEP OUT OF REACH OF CHILDREN WARNING/AVISO

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail.)

Precautionary Statements

Hazards to Humans and Domestic Animals

WARNING/AVISO

Causes substantial but temporary eye injury. Harmful if swallowed. Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals. Wear protective eyewear (goggles or faceshield). Do not get in eyes, on skin, or on clothing. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, or using the toilet. Remove and wash contaminated clothing before reuse.

Environmental Hazards

This pesticide is toxic to fish and wildlife. Do not apply directly to water, to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not apply when weather conditions favor drift from target areas. Do not contaminate water when disposing of equipment wash water or rinsate. This product is highly toxic to bees exposed to direct treatment or residues on blooming crops or weeds. Do not apply this product or allow it to drift to blooming crops or weeds if bees are visiting the treatment area. Use of this product may pose a risk to threatened and endangered species of fish, amphibians, crustaceans (including fresh water shrimp), and insects. All use of this product in the state of California should comply with the recommendations of the California Endangered Species Project. Before using this product in California, consult with your county agriculture commissioner to determine use limitations that apply in your area.

This product may impact surface water quality due to runoff of rain water. This is especially true for poorly draining soils and soils with shallow ground water. This product is classified as having a medium potential for reaching both surface water and aquatic sediment via runoff for several weeks to months after application. A level, well maintained vegetative buffer strip between areas to which this product is applied and surface water features such as ponds, streams, and springs will reduce the potential loading of abamectin from runoff water and sediment. Runoff of this product will be reduced by avoiding applications when rainfall is forecast to occur within 48 hours.

Physical or Chemical Hazards

Do not use or store near heat or open flame

STORAGE AND DISPOSAL

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Residue Removal: Triple rinse or pressure rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container $\frac{1}{4}$ full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Pressure rinse as follows: Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 PSI for at least 30 seconds. Drain for 10 seconds after the flow begins to drip.

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